

CLAIMS

1. A method of producing mechanical pulp, comprising impregnation of fiber material with an enzyme-containing aqueous liquid prior to defibration and refining of the fiber material to produce a mechanical pulp, characterised in said enzyme-
5 containing aqueous liquid being a pectinase-containing aqueous liquid and in initial compression of the fiber material.
2. A method according to claim 1, characterised in that said initial
10 compression of the fiber material is a mechanical compression, preferably combined with a thermal pretreatment of the fiber material, preferably by steaming, before the impregnation.
3. A method according to claim 2, characterised in that steaming is carried
15 out, preferably at atmospheric pressure, for 1 to 30 min, preferably 10 to 20 min.
4. A method according to claim 2 or 3, characterised in that compression is
performed by a compression screw or a twin roll press, with a compression ratio of 1:1
to 8:1, preferably 2:1 to 5:1.
- 20 5. A method according to anyone of the preceding claims, characterised in that the pectinase-containing liquid comprises an enzymatic preparation with pectolytic activity for both pectins and esterified pectins.
6. A method according to anyone of the preceding claims, characterised in
25 that the aqueous liquid comprises two or more enzymatic preparations wherein at least one of the preparations has pectinase activity.
7. A method according to anyone of claims 1-5, characterised in that the
pectinase is added as a biological agent comprising one or more fungi or bacteria, at
30 least one of which having pectolytic activity.
8. A method according to anyone of the preceding claims, characterised in
that the pectinase arises from a group of microorganisms containing *Aspergillus*
aculeatus and *Aspergillus oryzae*.
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9. A method according to anyone of the preceding claims, characterised in
that the charge of pectinase is 2,000,000 to 200,000,000 polygalacturonase units/ton

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fiber material, preferably 10,000,000 to 50,000,000 polygalacturonase units/ton.

10. A method according to anyone of the preceding claims, characterised in that the aqueous liquid comprises at least one chelating agent, preferably
5 diethylenetetraminepentaacetic acid at a charge of 1 to 10 kg/ton and/or sulfite at a charge of 5 to 50 kg/ton.

11. A method according to anyone of the preceding claims, characterised in that a retention time after uptake of the impregnation liquid is 3 min to 24 hours,
10 preferably 15 to 240 min, and more preferably 30 to 120 min.

12. A method according to claim 11, characterised in that a temperature in the retention after uptake of the impregnation liquid is 20 to 100°C, preferably 35 to 70°C, and more preferably about 50°C.
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13. A method according to anyone of the preceding claims, characterised in that a pH in the impregnation liquid is 3 to 10, preferably 4 to 7, and more preferably about 5.

20 14. A method according to anyone of the preceding claims, characterised in that the defibration and refining of the fiber material is performed by use of single disc, double disc or conical refiners in one or multi stages.

15. A method according to claim 14, characterised in that a refiner rotation
25 speed is 1000 to 3000 rpm, preferably 1500 to 2600 rpm.

16. A method according to claim 14, characterised in that the fiber material is preheated for 2 to 10 min before refining, that a refiner pressure is from atmospheric up to 5 bar, preferably up to 4 bar and that a refiner rotation speed preferably is 1200 to
30 1800 rpm.

17. A method according to claim 14, characterised in that the fiber material is preheated for 3 to 30 sec before refining, that a refiner pressure is from 4 to 8 bar, preferably 5 to 8 bar and that a refiner rotation speed preferably is above 2000 rpm.
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18. A method according to anyone of the preceding claims, characterised in that said fiber material is softwood chips or hardwood chips.
19. A method according to anyone of claims 1-17, characterised in that the
5 fiber material is non-wood fiber material including bagasse, bamboo, reed and straw.
20. A method according to anyone of the preceding claims, characterised in that the pulp obtained after defibration and refining is bleached, preferably with alkaline peroxide, to obtain bleached pulp having high brightness.
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21. Mechanical pulp, characterised in that it has been produced according to any one of claims 1-20.

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